

REMARKS

Claims 1, 2 and 7-10 are pending in the application.

Claims 1, 2 and 7-10 are rejected.

Claims 1, 2 and 7-10 are rejected under 35 U.S.C. § 103(a).

Claim 1 has been amended to correct a typographical error.

Claims 42-46 have been added.

No new matter is added.

Claims 1, 2, 7-10 and 42-46 remain in the case for consideration.

Applicant requests reconsideration and allowance of the claims in light of the above amendments and following remarks.

Claim Rejections - 35 U.S.C. § 103

Claims 1-2 and 7-10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Yu (US 6,531,358 B1), hereinafter “Yu,” in view of Chien (US 5,861,331), hereinafter “Chien.”

Claim 1 stands rejected under § 103(a) as obvious over Yu in view of Chien. The Applicants respectfully traverse this rejection. Claim 1 is directed to an etching method comprising:

- providing a wafer having a dielectric layer and an electrode partially protruding from a top surface of the dielectric layer;
- etching the dielectric layer with a chemical solution; and
- prior to etching the dielectric layer, reducing the protruding portion of the electrode, wherein reducing the protruding portion includes recessing a top surface of the electrode at least 500 angstroms below the top surface of the dielectric layer.

In particular, claim 1 includes the limitations of providing a wafer having a dielectric layer and an electrode partially protruding from a top surface of the dielectric layer and recessing a top surface of the electrode at least 500 angstroms below the top surface of the dielectric layer.

In contrast, Yu teaches an electrode protruding above a photoresist layer that is not recessed below a top surface of the photoresist layer. Specifically, in the Office Action, it is asserted that Yu discloses “providing a wafer 10 having a **dielectric layer 30** and an electrode 26 partially protruding from a top surface of the dielectric layer (Fig. 8).” *See* page 2 (emphasis added). The Applicants agree that in Fig. 8 Yu appears to teach an electrode 26 partially protruding above the top surface of the photoresist layer 30. However, the Applicants respectfully point out that Yu never discloses etching the electrode below the top surface of this

photoresist layer 30. Rather, Yu teaches the electrode 26 being etched back “using a blanket polysilicon etch, for example, to recess the bottom plate electrode *from the top of the opening*, as illustrated in Fig. 9.” Col. 3, lines 54-56 (emphasis added). At no point in this description does Yu teach the electrode being etched below the top surface of photoresist layer 30. Further, Yu teaches “etching away said first conducting layer [the lower electrode] *where it is not covered by said photoresist layer* whereby said first conducting layer is recessed by 1000 to 2000 Angstroms *from said top surface of said openings*.” Col. 5, lines 13-16 (emphasis added). Thus, not only does Yu not teach etching the conductive layer below a top surface of photoresist layer 30, but he specifically says to etch it only where it is not covered by the photoresist layer, which logically must be above or even with the top surface of the photoresist layer.

In addition, the Office Action has stated that the previous allowability of claim 4 was withdrawn because Yu (col. 5, lines 15-16) says to etch the electrode between 1000 and 2000 angstroms, which is in part of the range claimed by old claim 4 (now incorporated in claim 1 as at least 500 angstroms). The Applicants, however, traverse this assertion as well because claim 1 claims that the electrode is etched at least 500 angstroms below *the top surface of the dielectric layer*. Yu, as set out above, teaches the first conducting layer being recessed 1000 to 2000 Angstroms *from said top surface of said opening*, **not** 1000 to 2000 angstroms below the top surface of the dielectric layer. Thus, the Applicants again submit that this limitation of claim 1 is novel over the teachings of Yu.

Therefore, because neither Yu nor Chien teach all of the limitations of claim 1, the Applicants submit that claim 1 is not obvious over Yu in view of Chien. As such, the Applicants submit that claim 1 is in proper form for allowance and request that the rejection under § 103(a) be removed.

Claims 2 and 7-10 depend from claim 1. Based at least on this dependency, the Applicants submit that claims 2 and 7-10 are likewise in proper form for allowance.

New Claims

Claims 42-46 have been added to the case. Support for these claims can be found in Figs. 1E-1G and the corresponding portion of the specification, as well as page 3, lines 19 and 33. Claim 42 depends on claim 1, and further specifies that the dielectric layer includes an oxide. In contrast, as mentioned above, the Examiner cites a photoresist layer (30) as teaching

the dielectric layer. However, photoresist layers do not include oxides because they function by being developed and hence typically include resins and polymers that can be developed. In particular, an oxide in a photoresist layer would interrupt a development process and render the photoresist unusable for its intended purpose. Therefore, the Applicants submit that claim 42 is allowable based both on its dependency and the discussion set out above.

Claim 43 contains similar limitations to claim 1, but includes further limitations as to the electrode etching process. In particular, claim 43 sets out that the electrode is surrounded by and protrudes above a first and second dielectric layer and that it is recessed below the top surfaces of both the first and second dielectric layers. Further, claim 43 includes a limitation directed to etching the first and second dielectric layers to expose substantially all of the sidewall portion of the electrode. In contrast, neither Yu nor Chien teach these limitations. Thus, based at least on these limitations and the discussion set out above with respect to claim 1, the Applicants submit that claim 43 is also in proper form for allowance. Claims 44-46 depend from claim 43 and are likewise in proper form for allowance for their dependency and their own merits.

Conclusion

For the foregoing reasons, reconsideration and allowance of claims 1, 2, 7-10 and 42-46 of the application as amended is requested. The Examiner is encouraged to telephone the undersigned at (503) 222-3613 if it appears that an interview would be helpful in advancing the case.

Respectfully submitted,

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